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ABSTRACT

A pilot project in computer-assisted learning was conducted to allow adults who have not succeeded in traditional education programs to work independently at their own level and receive regular constructive feedback. The project was also intended for adults requiring specialized training to get this training in their community and improve their chances of either becoming employed or raising their level of employment. Computer systems were installed in all Keewatin (Canada) communities in August 1987. The system consisted of a local area network of either five or eight computer terminal workstations, connected to a file server that stores the courseware, a printer, and a communications modem. The instructional package purchased was Plato, courseware providing academic upgrading for grades 4-13. Plato was to be used three hours daily as part of the adult basic education program. Business application software was also used extensively. The number of students attending the centers and applicants for the next year increased markedly. The rate of learning significantly increased. Students gained job readiness skills through academics, job search, and life skills programs in Plato. Students' chances of getting employment increased because of their new skills and employer perceptions of students who can use a computer. (Project flowcharts and models are appended.) (YLB)

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REPORT ON YEAR I OF 2 YEAR PROJECT
OF
KEEWATIN REGIONAL EDUCATION AUTHORITY
PILOT EDUCATION PROJECT (KREA): COMPUTER ASSISTED LEARNING
ADULT EDUCATION KEEWATIN REGION

DECEMBER 1, 1988

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REPORT ON YEAR I OF 2 YEAR PROJECT
OF
KEEWATIN REGIONAL EDUCATION AUTHORITY
PILOT EDUCATION PROJECT (KREA): COMPUTER ASSISTED LEARNING
ADULT EDUCATION KEEWATIN REGION
EXECUTIVE SUMMARY

This is a descriptive report of the first year of a
2 year Computer Assisted Learning Project covering the
period of May 15th, 1987 to May 14th, 1988.

PROJECT GOALS.

1. To improve and expand, through the implementation of
Computer Assisted Learning (CAL), academic upgrading, job
readiness and special skill training for adults in the
Keewatin Region. To respond to the special needs of
unemployed Inuit who were not reached in the past by
traditional training methods.

2. To provide specialized skills training to unemployed Inuit
and other members of the community that is not usually
available in small communities. Special attention will be
paid to areas of training where local employment is
available.

DESCRIPTION

The project is sponsored by the Keewatin Regional Education
Authority (KREA) and funded as a pilot project by Canada
Employment and Immigration (CEIC) Innovations Program and The

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Department of Advanced Education, Keewatin Region. Rod Taylor, Superintendent of Advanced Education, developed the project and is the Project Manager. Heidi Wolter, Coordinator for Continuing Education is the Project Coordinator. Patrick Fahy, Ph.D., Director of Research and Evaluation at Alberta Vocational Centre is the independent evaluator approved by CEIC. The project has been carried out by the Adult Educators in all the communities in the Keewatin Region, with the support of their education authorities.

The Innovations Program provided funding in the amount of \$1,285,000.00 over two years for computer hardware, educational software, development of Inuktitut courseware, casual instructors, furniture, administrative support and external evaluation. The Department of Advanced Education provided the equivalent dollar amount in person years, facilities and program operation and maintenance costs.

EQUIPMENT

Computer systems were installed in all Keewatin communities in August 1987. The system consists of a Local Area Network (LAN) of either 5 or 8 computer terminal workstations, connected to a file server that stores the courseware, a printer and a communications modem.

At the beginning of the second year the number of computers will be increased to 10-12 in each community, except for Whale Cove.

The instructional package is Plato, courseware providing Academic Upgrading for Grades 4 - 13. Plato is used three hours daily as part of the A.B.E. program. Business application software is also being used extensively.

ANTICIPATED RESULTS

The 'Anticipated Results' of the project on the original proposal are as follows:

- a) Attracting and maintaining interest of a greater segment of the target population in educational programs.
- b) Producing faster progress in academic training
- c) Providing job readiness skills.
- d) Increasing chances of getting employment or improving level of employment.
- e) The creation of a new more effective educational model for Inuit students that may be used throughout the Arctic.

FINDINGS

- a) There has been an increase in the number of students attending the centres in the first year. The number of applicants for the second year has increased markedly.
- b) In some centres there was a significant increase in rate of learning. At the Eskimo Point centre the average T.A.B.E. increase per training day using Plato, was 4 times that of students in the year previous. Overall the greatest gains

were in Mathematics.

c) Job readiness skills included academics, Job Search and Life Skills programmes in Plato. Most students are using word-processing packages and many are using business applications software.

d) The chances of getting employment have increased not only because the students have new skills, but also because of the the perception of employer of a student who can use a computer.

e) The computer system provides a student centred mode of learning. For the full-time Academic Upgrading student, the portion of time that he/she is spending on the computer is self-directed learning. The learner is evaluated objectively by the system rather than subjectively by an instructor. For the part-time learners, be they apprentices, work release people or workers, we now have a mechanism for providing academic upgrading, computer literacy and business applications in a flexible, on demand basis.

The report looks at the rationale for the project, the implementation, and the results. It presents qualitative data, anecdotal material, viewpoints of students, adult educators and management. It outlines the plans for Year II.

PLANS FOR YEAR TWO

The following are the plans for year II:

1. Contract for software development of Inuktitut Grammar

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Course, to comply with the submission and funding in the original proposal.

2. Purchase customized Inuktitut word-processing software.
3. Deliver Inuktitut literacy component of A.B.E. programs in all centres.
4. Purchase additional Plato courseware in Basic Skills (Grammar) and High School Skills (technical/vocational).
5. Purchase additional computer workstations and furniture.

Patrick Fahy, Ph.D. has written a statistical analysis of the first year that has been distributed and is available from Advanced Education, Keewatin Region.

The next report written by the Coordinator of the project, in May 1989, will include the information in this report and add the data collected and the events that have taken place between May 1988 and April 1989.

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INTRODUCTION

This is a descriptive report of the first year of a 2 year Computer Assisted Learning Project. The first year is the period between May 15th, 1987 and May 14th, 1988.

This project is Sponsored by the Keewatin Regional Education Authority (KREA) and funded as a pilot project by Canada Employment and Immigration (CEIC) Innovations Program and The Department of Advanced Education, Keewatin Region. Rod Taylor, Superintendent of Advanced Education, developed the project and is the Project Manager. Heidi Wolter, Coordinator for Continuing Education is the Project Coordinator. Patrick Fahy, Ph.D., Director of Research and Evaluation at Alberta Vocational Centre is the independent evaluator approved by CEIC. The project has been carried out by the Adult Educators in all the communities in the Keewatin Region, with the support of their education authorities.

The purpose of this report is to describe and record the process of implementation in a way that will provide some insight and information for anyone who wishes to replicate the project.

BACKGROUND

There has been some form of adult education in the Keewatin Region for more than fifty years. It began at the Catholic Missions, where adults were taught to read the bible. Informal adult education has also been offered by other

institutions such as the Housing Corporation.

The Department of Education set up adult education centres in three communities more than ten years ago, in recent years more have been added, but it has only been since the beginning of this project (1987) that there has been an adult education centre in each community.

The original role of the centres seemed to have been to make academic upgrading, general interest courses and career counselling available to members of the community. In the past, the centres appear to have had a fairly low profile in the communities. This role is now changing quite rapidly, as the communities begin to demand more structured approaches to instruction and the number of students begins to increase. This change is stimulated by the growth of the wage economy that requires workers to have at least a basic education in order to get and keep a job.

As the population of the communities move from a traditional based economy to a more wage based economy a demand for different marketable skills is beginning to emerge. Students who saw little value in education when they were in school are finding that they need to be at least functionally literate in English to get a job in this economy. They have also found that they need specific training for some jobs and

the training is usually only available in English. The rate of functional illiteracy in English in the North West Territories is about 77%, and so the Inuit population have difficulty competing in the local job market.

What we see then is that " Jobs and training opportunities in the Keewatin Region are frequently not being filled by local Inuit due to their lack of prerequisite education. A large number of Inuit are under-educated as well as unemployed in this Region and require specialized community based educational and skill training" ¹

It became necessary to examine our approach to adult education and to find a way to serve more of this target population. One of the reasons why we had not reached this population is that the people were in small communities and the numbers were not enough to support a large education centre that provided specialized training. We could not centralize these programs in one large community because the students do not want to leave their communities. The question then arises of how do we provide a broader base of education and training at the community level.

At the community level, another reason we had not met the needs of our target population was to be that the traditional approach to instruction had not attracted many students. The next question we must ask ourselves at this

point, is what instructional approach would attract more students?

PROJECT DESCRIPTION

When the Innovation Program was made available by CEIC it was an ideal opportunity to find out if other modes of instruction and other teaching methodologies would be more appropriate and successful with our target population. Considering all these factors, Rod Taylor, Assistant Superintendent for the G.N.W.T. Department of Education established the goals for the project, obtained support and sponsorship from the Keewatin Regional Education Authority and applied for an Innovations program grant.

The Innovations Program approved funding for this project in the amount of \$1,285,000.00 over two years. This amount included funding for Computer hardware, computer furniture, software, educational courseware, software development for Inuktitut instruction, instructor support, and administrative support. This funding also included the costs of contracting an external evaluator.

The Department of Education in the Keewatin Region agreed to provide an equivalent dollar amount over the same two year period in the form of person years and the related costs i.e. time of adult educators, project coordinator, project manager and support staff and their travel costs. They also provided the facilities and program operation and maintenance

costs.

Project goals.

The project design was based on the goals stated below.

1. To improve and expand, through the implementation of Computer Assisted Learning (CAL), academic upgrading, job readiness and special skill training for adults in the Keewatin Region. To respond to the special needs of unemployed Inuit who were not reached in the past by traditional training methods.

2. To provide specialized skills training to unemployed Inuit and other members of the community that is not usually available in small communities. Special attention will be paid to areas of training where local employment is available.

Objectives:

The main objective of this project is to conduct a pilot project in Computer Assisted Learning that will allow:

a) adults who have not succeeded in traditional education programs to work independently at their own level and receive regular constructive feedback; and

b) adults requiring specialized training to get it in their

community and improve their chances of either getting employment or raising their level of employment.

PROJECT IMPLEMENTATION

The following section will describe the activities involved in the implementation process in chronological order.

In February of 1987, the adult educators from all the Keewatin Communities met with the Project Manager in Rankin Inlet. A needs assessment was completed and decisions were made on what the programs should consist of, what software would be required and what hardware would be needed to support the software. Representatives from Control Data Corporation attended this meeting and introduced the Plato System. With the information provided from the February meeting, the Project Manager wrote an Invitation to Tender and followed the required procedures. From the tenders submitted, it was decided that Control Data Corporation would be contracted to supply most of what was needed for the project.

Control Data Corporation (CDC) was awarded the contract for hardware, Plato courseware, installation, training, support and furniture. The decision was based on the fact that the courseware that it offered was self-contained, fully managed and the most comprehensive available. It was important too that the company had such installations at other sites and a

track record of providing 'after-sales' support. The hardware is a Local Area Network (LAN) system that comes with the touch-screen monitors needed for the Basic Skills courseware. The furniture had been chosen to suit the workstations that formed part of the system. (A detailed description of the LAN and courseware is attached). Dr. Patrick Fahy, was approved by CEIC to be contracted to perform an independent evaluation to address the effectiveness of the Proponent to meet the objectives of the project.

In July, as promised by the vendor, the equipment and materials were delivered to the Adult Education Centres in each of the seven Keewatin communities.

While the tendering and purchasing process was going on, new centres were being set up and staff was being hired. A project coordinator was hired and adult educators were hired to fill vacancies in five of the seven communities. Term and casual instructors were also hired for the beginning of the fall program.

There had been no adult educator in Whale Cove at all and only intermittently in Chesterfield Inlet. A building was acquired in Whale Cove to become both an adult education centre and an apartment for the Adult Educator. A building did exist in Chesterfield Inlet, but housing had to be acquired. All the centres had their electrical systems

examined and rewired to take the additional power requirements of the computers.

In August, 1987 the Adult Educators, the Coordinator of continuing Education and the Assistant Superintendent of Advanced Education (KREA Project Manager) met in Rankin to undertake nine (9) days training on the CAL system. The training was provided by two representatives from CDC. This included training on how to install and use the hardware in their communities and how to use and instruct the students in the Plato program.

Dr. Fahy attended this August meeting to set the criteria for his evaluation and instruct the group members on how to complete the evaluation measurement instruments.

In September 1987 the Adult Educators returned to their communities to install the equipment and begin their Adult Upgrading Programs. The Adult Educators had a support system of the Project Manager, the Project Coordinator and a 1-800 telephone Hot-line to the trainers and technician at The Control Data Corporation. At this time electronic communication systems were set up so that the Adult educators could communicate with each other and the Regional Office by an INET system. At the beginning of their courses, each centre advertised and put on an open house so that the community could see the new system in operation. Some of them

were interviewed on the radio and television.

In January 1988, another meeting was held in Rankin Inlet for all the Adult Educators and the Advanced Education staff. There were two objectives for this meeting. One was for CDC to give further training. A representative from CDC presented more courseware in Life and Job Coping Skills and Job Search Skills and trained the group members in its use.

The second objective was for the staff and Dr. Fahy to do some formative evaluations and suggest modifications to the programs.

In February 1988, a group consisting of the Project Manager, the Coordinator, Dr. Fahy and CDC technical expert toured all the communities. Up to this point neither Dr. Fahy nor the CDC representative had seen the system completely implemented in a community. By completely implemented is meant, the hardware and the software installed, the instructors using the training they had taken in August and the students working on the courseware.

Dr. Fahy was interested in seeing the installation sites and interviewing the students to collect data. The CDC technician was also interested in seeing the installation sites and that everything was running smoothly from a technical viewpoint. While he was at each site, Dr. Fahy interviewed the students

in groups and individually.

In April 1988, the Adult educators met with the Project Manager and Coordinator in Rankin to make a qualitative assessment of the project so far and to plan the second year of the project. Dr. Fahy had written a preliminary report based on the information gathered up to and during the February trip. The assessment was based on the implementation and use of CAL during the 1987/88 instructional year. (The discussion of this assessment is included at a later stage in the report.) The planning for the next year (1988/89) was to determine what additional hardware and CAL software would be purchased to supplement the existing courses or make new courses possible. Using a standard outline, the adult educators wrote short reports on their perspectives of the implementation of the CAL system. The comments from their reports have been incorporated in this report.

In June, 1988 Dr. Fahy completed a report on the first year of the project based on qualitative and quantitative measures, anecdotal data from logs and journals kept by participants and participant interviews (available).

PLANS FOR YEAR TWO

The following are the plans for year II:

1. Contract for software development of Inuktitut Grammar

Course, to comply with the submission and funding in the original proposal.

2. Purchase customized Inuktitut word-processing software.
3. Deliver Inuktitut literacy component of A.B.E. programs in all centres.
4. Purchase additional Plato courseware in Basic Skills (Grammar) and High School Skills (technical/vocational).
5. Purchase additional computer workstations and furniture, so that there would be ten to twelve units in each community.

A conference is planned for August 1988. This will be held to do the following:

- examine Dr. Fahy's report and do a formative evaluation of the project.
- plan any changes or adjustments that need to be made to improve the programs based on the formative evaluation.
- determine what components of the A.B.E. Curriculum Guidelines are being met by the C.A.L. System.
- discuss what materials and resources we need to build a total A.B.E. curriculum that can be used throughout the Keewatin.
- discuss the progress of the Inuktitut Grammar software that is being developed.

There will be two more Adult Education Conferences during the second year of the two year project. The next one will be in January 1989 to update the computer system and do another

formative evaluation on the project. The second conference will be in April 1989. This will be the final evaluation and two reports will be written from that conference. The Project Coordinator will submit a report for the Innovations Branch of CEIC before May 31, 1989 and Dr. Fahy will submit a Year Two report by July 31, 1989. It is hoped that these final reports will, together, provide a comprehensive account of the two year project and serve as a model for any other region or organization that is considering this kind of innovation.

CAL SYSTEM IMPLEMENTATIONS.

The communities

The Keewatin Region is made up of seven (7) communities ranging in size of populations from approximately one hundred and eighty (180) in Whale Cove to approximately one thousand, four hundred (1,400) in Rankin Inlet. The Inuit population of these communities range from 77% in Rankin Inlet to 99% in Chesterfield Inlet. These communities are geographically isolated in that they can only be reached by plane most of the year except for a short period in the summer when they can be reached by boat.

The first language is Inuktitut, of which there are many dialects. The functional literacy level in the English language is reached by about 23% of the population.

The Adult Education Centres.

There is an Adult Education Centre in each of the communities with a mandate to provide Academic Upgrading to a grade ten level for adults. The adult centres are housed in various types of locations, typically they are located in school portables, or older refurbished buildings.

All of the centres offer Academic Upgrading on a full-time basis and part-time either during the day or evening. In addition to these courses they offer a variety of other courses that include business courses, computer applications, Inuktitut, Traditional skills and general interest courses such as Firearm Safety or photography.

The target clientele are the unemployed, but participants in the Upgrading courses also include, apprentices, in-service trainees and employees on work release programs. Six of the centres have had Job Entry programs running this year. The Job Entry programs include courses in Academic Upgrading, Life and Work Skills and work experience.

The computer systems.

The computer system in each community consisted of a Local Area Network of either 5 or 8 computer terminal workstations, connected to a file server that stores the courseware, a printer and a communications modem. At the beginning of the second year the number of computers will be

increased to 10-12 in each community, except for Whale Cove. The number of students in Whale Cove and the size of the centre does not warrant more than 6 computers.

The courseware is Plato. This is a managed package of software that includes Basic and High School Skills CAL materials in Reading, Writing, Mathematics, High School Science, Social Studies, Life Skills and Job Search Techniques. The latter two are supplemented with print material and videos. The Basic Skills begin by diagnosing the students level with Placement Tests. Once placed the student then begins the courses at that level. A student record is automatically kept for each course and both the student and the instructor can monitor the student's progress.

In addition to this there is software in word processing, spread sheets, database management and electronic communications. In the second year we will add Multilingual Scholar, a word processing package that has been customized to use Inuktitut syllabics. We are also in the development stage of an Inuktitut grammar course.

The projects.

In each centre the CAL system has been used for approximately 50% of the Academic Upgrading and Life Skills. It has been used to teach word processing and business applications.

From the outset of this project the Adult Educators have been generally enthusiastic and committed to the success of the project. It was agreed that they would implement the program fully and according to the training they had received. It was also decided that each full-time student would spend 50% of his/her day using the Plato system and that part-time students would spend as much of their course as possible on the system.

It was also agreed that they would use the computer system as much as possible to provide special skills to those working in the business community so that these clients could raise their level of employment.

From the perspective of the Coordinator, the Adult Educators have made every effort to comply with these agreements. They have carried out the implementation very successfully. Overall the program has had a very successful first year. At the beginning of the second instructional year, there has been a marked increase in the number of applicants for the Academic Upgrading programs and existing business application courses. In some centres there has been a demand for more business application programs.

The Problems

There have been some minor technical problems with the equipment. These are as follows:

1. Because of the dry air, some of the touch screens on the monitors ceased to function. This has hopefully been corrected by installing humidifiers in the centres and using a static-guard spray.

2. There were technical "glitches" in the courseware. This had resulted from having the courseware loaded into a LAN system. In other CDC sites it has been used originally on a large central system or on floppy disks. Many of these "glitches" have been removed but there are others that the vendor needs more time to correct.

3. Not being a computer expert and being in an isolated community has presented some difficulties for some Adult Educators. If something happened to suspend the use of one of the terminals, they found it frustrating if they did not get an immediate response from the Hot-Line number. However they have been patient and managed to overcome this frustration.

4. Some of the centres felt that they did not have enough computers to meet the student's demands last year, but this has been corrected for the second year.

Adult Educators' Perspectives.

In discussions with the Adult Educators it was found that they perceived the first year to be a success. They were pleased with the impact that the Innovations project had on their students and their centres as a whole. We have the same Adult Educators on staff going into the second year of the project and they seem to be very enthusiastic about the possibilities of the system for this year.

Their students liked working with the computers. They were able to work independently and develop additional skills such as computer literacy and word processing. The students perceived themselves differently because they were able to use computers. The centres were able to attract students who would not have gone to the centre to participate in a traditional program, perhaps because they had been unsuccessful in them before. The centre is now perceived in a different way because of the Innovations project. Many of the community business organizations, in both the public and the private sector are installing computers and are either seeking employees from the centres or sending their employees there for training. The centres are also getting requests from employed people who want to upgrade their skills.

From this information one can state that the main objective

of this project is being met. That objective being " to conduct a pilot project in Computer Assisted Learning that will allow:

- a) adults who have not succeeded in traditional education programs to work independently at their own level and receive regular constructive feedback; and
- b) adults requiring specialized to get it in their community and improve their chances or either getting employment or raising their level of employment. "

ANTICIPATED RESULTS.

The 'Anticipated Results' on the original proposal for the Innovations Project are as follows:

- a) Attracting and maintaining interest of a greater segment of the target population in educational programs.
- b) Producing faster progress in academic training
- c) Providing job readiness skills.
- d) Increasing chances of getting employment or improving level of employment.
- e) The creation of a new more effective educational model for Inuit students that may be used throughout the Arctic.

This report is not meant to be of a statistical nature. Dr. Fahy the independent evaluator has been collecting statistical and anecdotal data since September 1987 and has issued two reports. The first one was a preliminary report based on the data collected up to February 1988. The second

was a final report for the first year presenting a statistical analysis of the data collected up to April 1, 1988. From the raw data we have and questions posed to the adult educators we were able to show that we were indeed getting the results we anticipated. Those 'anticipated results' are stated in the form of objectives and a qualitative evaluation of how they were met is recorded here. The quantitative data is recorded in the Year One Report by Patrick Fahy Ph.D

OBJECTIVE A: ATTRACTING AND MAINTAINING INTEREST OF A GREATER SEGMENT OF THE TARGET POPULATION IN EDUCATION PROGRAMS.

In order to establish this data from 1987/88 instructional year they must be compared with that of previous years. This statistical analysis is available in Dr. Fahy's report. From the raw data and the information gathered from the adult educators we are able to state the following:

1. There was an increase in the number of adults participating in adult education programs in the first year and the applications for the second year showed a marked increase. (Eskimo Point reports an increase of 500%)
2. Students in almost all the centres have stated that they were attracted to the Adult Education Centre courses by the computers
3. Many new students in Baker Lake said they were attracted to the Adult Centre this year by the computers. Working

people who had computers in their work places were attracted to evening courses. It appears that a new and more varied clientele participated in centre programs last year and this trend continues this year.

4. Students whom had been unsuccessful in completing a year of Academic Upgrading before had completed the 1987/88 year because of the computers.

5. There was a different type of student attracted to the Adult Education Centres. These students appeared to be highly motivated, had more clearly defined career goals and preferred to work independently.

6. There were many more part-time students who were interested in improving their job possibilities. Because of the availability of computers, working people could come in and work on their academic skills, or attend the computer literacy courses that were now being offered.

7. As computers are now available, more courses were put on to meet the needs of the business communities. Computer Literacy, Word processing, Spread Sheets and Database Management courses were made available at many of the centres. It is expected that the numbers of courses will increase with demand.

OBJECTIVE B: PRODUCING FASTER PROGRESS IN ACADEMIC TRAINING.

1. Preliminary comparisons of T.A.B.E. results of students from 1986/1987 academic year with the 1987/88 indicate that there was an increase in progress in some centres. However we do not have the statistical data available to show how significant the increases are.

2. At the Eskimo Point Centre it was found that their average T.A.B.E. increase per training day for the students who used the Plato System was 4 times that of the students of the previous year.

3. It was found that the greatest increase was for students at the higher levels, i.e. students who's entrance T.A.B.E. was 7.0 or more made greater gains than those below 7.0.

4. Using raw data, some centres found that the T.A.B.E. gain was not apparently greater than the previous year.

5. Most Adult Educators agreed that the greatest gains were made in Mathematics.

OBJECTIVE C: PROVIDING JOB READINESS SKILLS

1. One of the major outcomes of this project is that the students are using computers. There is a general perception that those who are able to use computers are in some way smarter than those who cannot. This perception has worked

well for the students. The students are perceived differently by the business community and they perceive themselves differently. Therefore, just having the exposure to the computers has enhanced their job readiness.

2. The Academic Upgrading students have learned word-processing and use it to do their writing assignments. This has given them a marketable skill and the confidence of knowing that they do have a skill that is in demand and becomes more in demand as the local employers are incorporating computers into their operations.

3. Computer Literacy, word processing and the definitive academic content of the Plato system has certainly enhanced their resumes.

4. The Job Search and Life Skills programs that the system has made possible, has given students the leading edge over other members of the community when applying for jobs. The Adult Education students have been taught to use a systematic approach to job seeking. They have also examined their own work behavior and developed the knowledge and confidence to present themselves well at interviews.

5. Many social skills that cannot be measured objectively have enhanced the employability of the students. These include a greater degree of confidence from working with

technology and a recognition of themselves as adult learners from working independently.

OBJECTIVE D: INCREASING CHANCES OF GETTING EMPLOYMENT OR IMPROVING LEVEL OF EMPLOYMENT

Meeting this objective cannot be fully evaluated until this year's program has been completed and enough time has lapsed for students to apply for positions, however what has transpired thus far has given us to believe that the program has met and will continue to meet this objective. The following are the Adult Educators observations.

1. In response to the computers, the perception of the business community has become such that they approach the Adult Educators to recommend potential employees.

2. In Chesterfield Inlet, one student was asked to become a classroom assistant after graduation and the Adult Educator felt that this would not have happened if the student had not become computer literate.

3. In Repulse Bay local businesses are bringing work into the centre for students to do on the computers. This reflects positive impressions of the business community and can only give the student the kind of exposure that leads to employment after completion of his/her course.

4. In Coral Harbour, community employers have contacted the Adult Education Centre personally, to have specific students apply for jobs. Employers have or plan to have employees participate in Academic Upgrading on a work release basis. The demand for this has been greater this year than in previous years.

5. In Rankin Inlet, as with other centres, they found it easier to accommodate government trainees and apprentices who need to upgrade their academic skills for their present positions. Previously they had been incorporated into an existing classroom situation or set up with individualized programs. It was often difficult to place them or provide the appropriate materials for their specific needs. The computers and Plato system has made it possible for these individuals and for the instructors to set up a more flexible program in terms of course content and time schedules. The Plato system is such that it diagnoses the students academic level in basic skills and the student can work independently in specific academic areas.(e.g. if a student is weak in math, he/she may work only in that area).

6. Eskimo Point staff have found that they are able to deliver educational services to more people because of the computer system. This alone increases employability. The Plato system has been successful in attracting people who are working and need additional skills, but have only a limited

time to spend. In Eskimo Point alone, approximately 20 working people took upgrading courses and another 20 participated in computer application courses. This has become the pattern for the other centres also.

7. As the Adult Educator in Eskimo Point has stated. " The centre is being perceived as producing a credible product. Many employers have phoned to inquire if students are available for work, especially if they have office skills. A number of students (8) have decided to leave the program and accept jobs.

OBJECTIVE E: CREATION OF A NEW, MORE EFFECTIVE EDUCATIONAL MODEL FOR INUIT STUDENTS THAT MAY BE USED THROUGHOUT THE ARCTIC.

1. Through the implementation of this project, we have created a more effective model of adult education and training. We are now able to reach students in sparsely populated, isolated communities. The model provides an integrated system that allows us to overcome the barriers to learning that exist in this environment. These barriers may be those of the traditional methods of education that have not been very successful, the lack of financial and human resources to offer flexible individualized and specialized training in isolated communities and the inability to communicate information efficiently with communities where there is no road access and severe weather conditions.

2. The Innovations Computer Assisted Learning Project provides computer hardware and the software for Academic Upgrading, Life Skills, Job Search Skills, Communications and Business Applications. The program is a learner centred, comprehensive computer-based learning tool. The concept in itself, is a new educational model, but what is important is that it is fully operational in seven communities and the regional office.

3. We have now something that we have not had before in the Region and that is a standardized core curriculum. A student may move from one community to another and begin exactly where he/she left off in the other community.

4. With the electronic communications, each adult educator is able to keep in touch with each other and their supervisor on a daily basis. They are able to send files, curriculum materials etc., to each other within minutes .

5. With both of these factors operation (2 & 3 above) we are developing a cohesive and accountable educational model.

6 .Within the larger new model of the system, we have the new model for learning for the student and instructor. For the student there is an independent learning experience. For the full-time Academic Upgrading student, the portion of time

that he/she is spending on the computer is self-directed learning. The learner is evaluated objectively by the system rather than subjectively by an instructor.

For the part-time learners, be they apprentices, work release people or workers, we now have a mechanism for providing academic upgrading, computer literacy and business applications in a flexible, on demand basis.

6. Bringing these factors together show that this system is the beginning of the creating of a new, more effective educational model. As it has been successfully implemented in the Keewatin over the past year, there appears to be no reason why it cannot be used as a standardized model for throughout the Arctic.

7. Those who have been trained and have implemented the system have gained expertise that can be used by and passed on to other regions that wish to implement the system.

The success of the model that is developing is seen in the findings for year one of the project in this report and in the report of Dr. Patrick Fahy. The model will be further developed and refined during the second year of the project.

CONSIDERATIONS

In contemplating installing CAL in any situation there are many factors that must be considered. The first consideration is why one would want to do it.

In our case the reasons for installing CAL were to meet the goals and objectives already stated in a manner that we had not been able to before.

In all communities we have an adult educator. In many of those communities the adult educator is the only person with instructor qualifications. However, the Adult Educators' duties include, community development, staff hiring and supervision, curriculum development, public relations, student counselling, administration and programme development and delivery. In some instances this also includes the training of an adult educator trainee.

In terms of programs, there is least one full time Academic Upgrading program, i.e. six hours per day, five days per week, and one part time program offered in the small communities during the instructional year. In the larger communities additional courses are offered when there is a demand and instructional staff are available.

The consequences of this situation were as follows:

- the adult educator was unable to teach classes in the

traditional way for six hours a day and carry out all of his/her other duties successfully.

- the number of students and programs were limited by the number of qualified instructors available.
- the subject content was limited by the adult educators knowledge. i.e. the adult educators do not have expertise in all the subjects the students may wish to learn.
- there was inconsistency with the programmes. Adult educators brought with them their own instructional methodology and consequently used materials that fit that methodology.

The reasons one would consider Computer Assisted Learning (CAL) are as follows:

- the CAL system is consistent. The software includes a core programme in Mathematics and English up to Grade 10. (This is only some of the courseware we use. The other courseware is listed in the appropriate section) This means that all the communities have the same course content for at least these core programmes.
- the Cal system teaches subject matter in the same format for all subjects. It also deals with subjects in which the instructor may not have much background e.g. Calculus.
- it expands the range of courses that can be offered. We can now offer high school courses to part-time students who simply wish to take one subject at a time.
- it allows the student to move at his/her own pace. The

courseware is structured so that the student takes a placement test and begins learning at the place that is appropriate for that specific student. Lessons are divided into tutorial, drill and test segments so that the student can challenge the test and need not complete the lesson if he/she is proficient in that area. The students can progress at a greater speed if they are only learning what they don't know.

- it allows the students to control their own learning. The courseware management software keeps records of the students progress and the instructor and the student can review these records on a weekly basis. This process is valuable because the CAL system shows the students how much they have accomplished that week, how well they scored and in what areas they need additional tutoring. - it is objective. The student/computer interface provides objective evaluation. The scores on tests reflects the students abilities consistently. Student/instructor relationships can often affect the progress that the student makes. In cases where this is a negative relationship, the student's progress can be impeded by a subjective evaluation.

- it allows the student exposure to subjects in which the instructor has little expertise and thus the student would not get the exposure in another way.

- it allows the instructor time to assist students individually.

The second factor to consider is why did we chose the Plato System.

The research for this project began in late 1985. When the decision was made to implement CAL, a search for appropriate software began. A systematic search across Canada was done to find out what software was being used elsewhere that would be suitable for the adult educations centres in the Keewatin. After consultation with vendors and users of educational software, Plato was found to be the most suitable. The Plato System (Programmed Logic for Automatic Teaching Operations) was developed originally in 1959 as a joint project between Control Data Corporation and Donald Blitzer at the University of Illinois (Pagliaro, 1983). Since then of course it has been constantly updated and adapted for use on a local area network system. The courseware continues to be updated to meet the Canadian market.

The Project Manager and an adult educator contacted institutions in British Columbia and Ontario, where the Plato system was being used. All the institutions contacted recommended it. Further investigation found that there was no other system that was as comprehensive. Not only did it include courseware that covered from Grade 3- 10, it was a completely managed system that included diagnostic tests and student record keeping.

Plato is a managed package of software that includes Basic

From the instructors viewpoint, it saves time and energy searching for the appropriate diagnostic material and they feel confident about the level at which the student is starting. I believe that it is easier to diagnose the level a student would be at in mathematics, but even in this case it is better to have expert diagnosis.

The management component of this system is really valuable. Student records are automatically kept for every course for every student. The instructor can call up the student's record to monitor the his/her progress. As mentioned earlier, the weekly meeting in itself, is a valuable process but as well as this an accurate record is being kept that the students can take with them should they move to another centre. It saves a lot of time for the instructor because there is no need to mark papers or keep cumulative records.

Success Factors

The third factor to consider is how can we ensure that it will be successful. The most important variable in the success of this project is that the people involved are committed to it. The implementation of any new system or methodology means change. In the literature of Industrial Sociology and Psychology there has been a lot of attention paid to employees resistance to change. The literature on automation in the work place provides examples of employees' behaviors that are indicators of resistance to change. The

introduction of computers is the introduction of automation. It is important that the manager of the project is aware of these indicators so that problems can be anticipated and prevented. It is important too, that when problems do arise that one can determine what is really happening and solve the problems quickly.

In the final analysis, it is the attitudes of those working on the project that will determine the success of the project. It is important that the managers of the project know how the employee feels before the project starts. If the person has no commitment to the project then minor setbacks will become major ones. For example, the person with the commitment will perceive a 'glitch' in the program to be annoying perhaps, but will see that in the context of the whole project it is a minor problem. However the person who feels negative towards the project will see the project in the context of this 'glitch' and it is a major problem. It is important then, that we know the employees perception of the project before we start so that it can be dealt with.

People have very valid reasons for feeling negative. It may be that they have had no control over the new environment in which they have to work. It may be that they feel the computer will replace them. Whatever the reason, it is best to know that this exists.

With the Adult Educators we made every effort to avoid this by involving them in the process from the beginning. For almost a year before the CAL system was implemented, the Adult Educators were consulted and at the conference in February 1987 they took part in the decision of what learning system to buy and in developing the criteria to evaluate the project. They have met as a group three times during the first year and will meet three times during the second year of the project to report on how it worked at their particular centres. They worked closely with the external evaluator Dr. Fahy and helped to redesign and refine his evaluation instruments. They wrote individual reports and used these to do formative evaluations upon which they would base their program the second year.

The Adult Educators built their commitment to the project by investing so much of their time and expertise as a group. Although there were specific expectations from the managers of the group, the adult educators were able to accurately assess the reality of those expectations because they were out in the field and knew the students and the circumstances.

As with all employees faced with some form of automation, I expect that there was some thought given to the computer replacing the instructor. I believe that they thought that at least their role would change. Neither of these things have happened. The CAL system has taken away some aspects of

teaching. Much of the diagnosis and marking has been taken away. The constant contact with all the students is not there either, as they spend half of their day on the computer. Because the students do not need constant attention, the instructor has more time to work with each on an individual basis. The CAL system is only a tool to help the instructor be more effective. It is a desirable way for students to learn and so it is increasing the numbers of applicants. Therefore more instructors will be needed in the near future, not less.

The Adult Educator's role has not changed significantly. The student has become more responsible for his/her own learning, but the direction must come from the instructor. Their teaching styles are changing because the Department's expectations of non-computer time is that it is spent in a more active learning style.

Training

The training plays a critical role in helping people adapt to new systems. It was particularly critical in this case because the Adult Educators had to go back to their communities and cope with this new technology knowing that the only further instructions they would be likely to get would be a voice on the telephone. They were solely responsible for installing their computer equipment. They had to be able to make back-up tapes on a weekly basis. They

also had to know how to use the courseware and to instruct the students to use it. This is quite an intimidating feat.

Some of the Adult Educators had used computers before and were fairly comfortable with the tasks involved. Some of them had had no experience with computers and felt quite overwhelmed at the beginning. The latter experience is likely to make the participant feel that they have no control over their environment and this is why proper training is crucial.

From my perspective I think the training was done well. The system was set up in the Rankin Adult Education Centre and the Adult Educators came in to take the training. The first two days were devoted to equipment installation. It was hands-on and by the end of the two days, everyone had connected up the LAN system and done a tape back-up.

The next seven days were devoted to the courseware. The participants were taught how to use the courseware. This included how to do placement tests, lessons and units and how to register students and keep track of students' progress. The trainees worked very hard during this time. They took the training during the day and the two trainers came back in the evening to give additional practice to those who wanted it. The trainees became a very cohesive group and helped each other.

When the Adult Educators went back to their communities, they had a hotline that they could call if they needed help. In many instances, they would call each other or the coordinator of the project if something was not working properly or they had forgotten a procedure. In retrospect, there have been no major problems. The centres had their systems up and running in time to start their courses. The Adult Educators did quite a remarkable job.

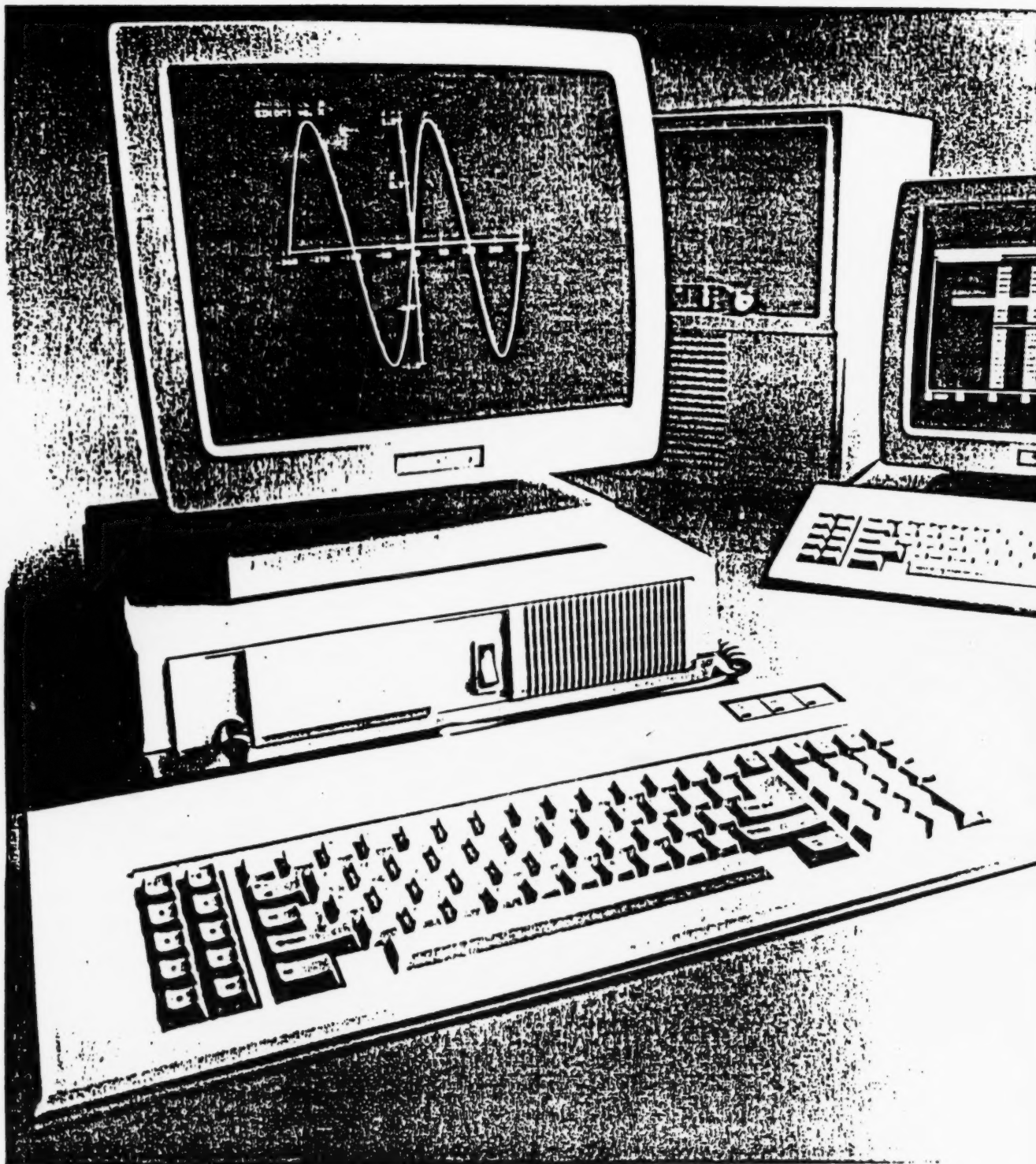
CONCLUSIONS

This is the beginning of the second year. We have the same staff members in the communities. They have experienced a lot of changes in the past year and have handled them well. They have begun this year with enthusiasm, anticipating and prepared for more changes as new courseware is added to the existing programs. They seem to feel that for themselves this is a valuable experience and has added to their professional growth and expertise. I believe that this applies to myself, as the coordinator, and to the manager of the project who along with the adult educators have worked closely as a team to carry out this project.

This report has attempted to describe the Innovations Computer Assisted Learning Project from the outset, to the beginning of the second year. It has looked at the rationale for the project, the implementation, and the results. It has attempted to show a holistic picture, by presenting

qualitative data, anecdotal material, viewpoints of students, adult educators and management.

The next report written by the Coordinator of the project, in May 1989, will include this information and add the data collected and the events that have taken place between May 1988 and April 1989.



The new PLATO/ Local PLATO Delivery System (LPDS) uses IBM PC-compatible technology to deliver training to more students, more efficiently. Individual workstations (front) can be used as stand-alone microcomputers to run additional computer applications. Correction educational facilities can link from 5 to 30 workstations to the new LPDS file server, which has an administration terminal (back) to access and manage the delivery of popular PLATO® courseware. Available to the corrections industry from Control Data Corrections Systems.

BILL OF MATERIALS

A. COURSEWARE

1. ACADEMIC AND EMPLOYMENT PREPARATION

A. INDIVIDUAL WORKSTATION LICENSES FOR PLATO LEARNING SYSTEM (PLS)

<u>QTY</u>	<u>DESCRIPTION</u>
45	Canadian Basic Skills Reading
45	Canadian Basic Skills Mathematics
45	Canadian High School Skills Reading
45	Canadian High School Skills Mathematics
45	Canadian High School Skills Writing
45	High School Skills Science
45	High School Skills Social Studies
45	Algebra Curriculum
45	Precalculus
45	Calculus I
45	Calculus II
45	Physics I
45	Physics II
45	Chemistry I
45	Chemistry II
45	
45	Understanding Self
45	Understanding Other
45	Overcoming Self-Defeating Behaviour
45	Communication Skills
45	Employability Attitudes
45	Customer Contact Skills

B. ADMINISTRATION GUIDES AND WORKBOOKS

<u>QTY</u>	<u>DESCRIPTION</u>
7	PLATO Learning System Administration Guide for Academic and Employment Preparation Curricula Includes rights to reproduction for each site

BILL OF MATERIALS

A. COURSEWARE (continued...)

1. ACADEMIC AND EMPLOYMENT PREPARATION (continued...)

B. ADMINISTRATION GUIDES AND WORKBOOKS

<u>QTY</u>	<u>DESCRIPTION</u>
7	Sets Basic Skills Reading Student Workbooks Includes rights to reproduce in each site
7	Sets Basic Skills Math Student Workbooks Includes rights to reproduce in each site

2. JOB SEARCH SKILLS

A. INDIVIDUAL WORKSTATION LICENSES FOR PLATO LEARNING SYSTEM

<u>QTY</u>	<u>DESCRIPTION</u>
45	Job Search Curriculum

B. ADMINISTRATIVE GUIDE AND WORKBOOKS

<u>QTY</u>	<u>DESCRIPTION</u>
7	JOB SEARCH ADMINISTRATORS KIT, includes: Manager Manual, Facilitator Manual, Job Developers Manual, Appendix and rights to reproduce for each site.
7	JOB SEARCH PARTICIPANT MANUAL, includes: rights to reproduce for designated site
7	SET OF JOB SEARCH FILLED FLIP SCRIPTS & REFILLS

BILL OF MATERIALS

A. COURSEWARE (continued...)

2. JOB SEARCH SKILLS (continued..)

C. AUDIO VIDEO MATERIALS

<u>QTY</u>	<u>DESCRIPTION</u>
7	Sets Of 12 Job Search Audiocassette Tapes
7	Sets Of 13 Job Search Videotapes

3. BUSINESS APPLICATION SOFTWARE PACKAGE TRAINING MATERIALS

a. STUDENT LEARNING GUIDES (includes rights to reproduce for each SITE)

<u>QTY</u>	<u>DESCRIPTION</u>
X 7	~~MS-DOS Student Learning Guide~~
X 7	~~Lotus 1-2-3 Student Learning Guide~~
X 7	~~dBASE III Student Learning Guide~~
X 7	~~Wordstar Student Learning Guide~~
X 7	~~ACC-PAC A/R Module Student Learning Guide~~

b. REFERENCE TEXTS

<u>QTY</u>	<u>DESCRIPTION</u>
X 7	~~1-2-3 Go (ADDISON-WESLEY)~~
X 7	~~Using 1-2-3 (QUE)~~
X 7	~~WORDSTAR Made Easy (ETTLIN)~~

c. COMPUTER-ASSISTED INSTRUCTION

<u>QTY</u>	<u>DESCRIPTION</u>
X 7	~~CDEX WORDSTAR Training Course~~

4. OFFICE PROCEDURES / COMPUTER LITERACY

<u>QTY</u>	<u>DESCRIPTION</u>
7	Generic Word Processing Student Kits
7	Generic Word Processing Learning Station Kits

BILL OF MATERIALS

A. COURSEWARE (continued...)

4. OFFICE PROCEDURES / COMPUTER LITERACY (continued...)

<u>QTY</u>	<u>DESCRIPTION</u>
X 7	~~Computers For Anyone Kit~~
X 7	~~Computers and Employment Kit~~
X 7	~~Notecard: Fundamentals Of Spreadsheets Kit~~
X 7	~~Personal Computer Uses Kit~~
X 7	~~Computer Careers Kit~~

B. SOFTWARE

1. PLATO LEARNING SYSTEM MANAGEMENT SOFTWARE

<u>QTY</u>	<u>DESCRIPTION</u>
7	PLATO Cluster Software
7	RBASE SYSTEM V Database Management And Report Writer

2. LOCAL AREA NETWORK SOFTWARE

<u>QTY</u>	<u>DESCRIPTION</u>
7	Sets 3+ SHARE
7	Sets 3+ TURBOSHARE
7	Sets 3+ MAIL

3. WORKSTATION SOFTWARE

<u>QTY</u>	<u>DESCRIPTION</u>
45	PLATO User Software
45	3+ User Software

4. BUSINESS APPLICATION SOFTWARE PACKAGES

<u>QTY</u>	<u>DESCRIPTION</u>
7	LOTUS 1-2-3
X 7	~~dBASE III~~

BILL OF MATERIALS

B. SOFTWARE (continued. . .)

4. BUSINESS APPLICATION SOFTWARE PACKAGES (continued. . .)

<u>QTY</u>	<u>DESCRIPTION</u>
X 7	WORDSTAR
X 7	ACC PAC A/R, A/P, G.L.
X 7	GEM DRAW
7	XTALK

5. COURSE AUTHORIZING PROGRAM

<u>QTY</u>	<u>DESCRIPTION</u>
7	Advanced Tutorial Model

C. HARDWARE

1. FILE SERVER

<u>QTY</u>	<u>DESCRIPTION</u>
8	3 COM 3SERVER3 with 70 MByte Hard Disk 70 MegaByte Expansion Unit, 960 KB RAM with 2 MegaByte RAM Expansion Card, 128 KB ROM, Serial Port, Parallel Port, 60 MegaByte Streaming Tape Back-up Unit, Data Shield Battery Back-up Unit, Real-Time Clock, 80 column N.L.Q. printer, Network Interface, Cables.

2. SINGLE DISK DRIVE WORKSTATION

<u>QTY</u>	<u>DESCRIPTION</u>
30	IBM PC Compatible, 640 KB RAM expandable, one 5 1/4" Flexible Disk Drive, detachable Keyboard, Network Interface Card, Hercules Compatible Graphics Card, 1 Serial Port, 1 Parallel Port, 5 Available Expansion Slots, Cables, MS-DOS

BILL OF MATERIALS

D. FURNITURE

1. STUDY CARRELS

QTY DESCRIPTION

- 25 Unit of 2 Study Carrels. Sides and back of Carrel extended 24" above table level for student privacy (custom ordered). Oak Arborite Finish, Chrome-plated Legs, Sturdy. Require Assembly (screws in pre-drilled holes)
Total of 50 study carrels as opposed to 45 ordered.

2. PRINTER / FILESERVER STANDS

QTY DESCRIPTION

- 7 36" X 20"D X 26 1/2" H. locking casters, English oak arborite, requires assembly.

3. STENO CHAIRS

QTY DESCRIPTION

- 45 Gas Lift Seat height adjustment, adjustable back-rest, charcoal coloured woven cloth seat & back

4. DISKETTE STORAGE UNIT

QTY DESCRIPTION

- 8 SOTAL Diskette Tray. Plastic, holds 100-5 1/4" diskettes, Removable hinged lid with lock, 8 dividers in base. No-mar rubber feet.

5. POWER BAR / SURGE PROTECTOR

QTY DESCRIPTION

- 15 Noise Filter and Surge Protector each with 6 outlets, on-off switch, 15 amp/125V circuit breaker with reset button. Nine foot power cord, plastic case.

BILL OF MATERIALS

C. HARDWARE (continued. . .)

3. DUAL DISK DRIVE WORKSTATION

<u>QTY</u>	<u>DESCRIPTION</u>
16	IBM PC Compatible, 640 KB RAM expandable, dual 5 1/4" Flexible Disk Drives, Detachable Keyboard, Network Interface Card, Hercules Compatible Graphics Card, 1 Serial Port, 1 Parallel Port, 5 Available Expansion Slots, Cables, MS-DOS

4. HIGH RESOLUTION MONITORS WITH TOUCH SCREEN

<u>QTY</u>	<u>DESCRIPTION</u>
46	512 X 512 Pixel, Monochrome Monitor with Touch Screen, 14" diagonal, non-glare, Cables

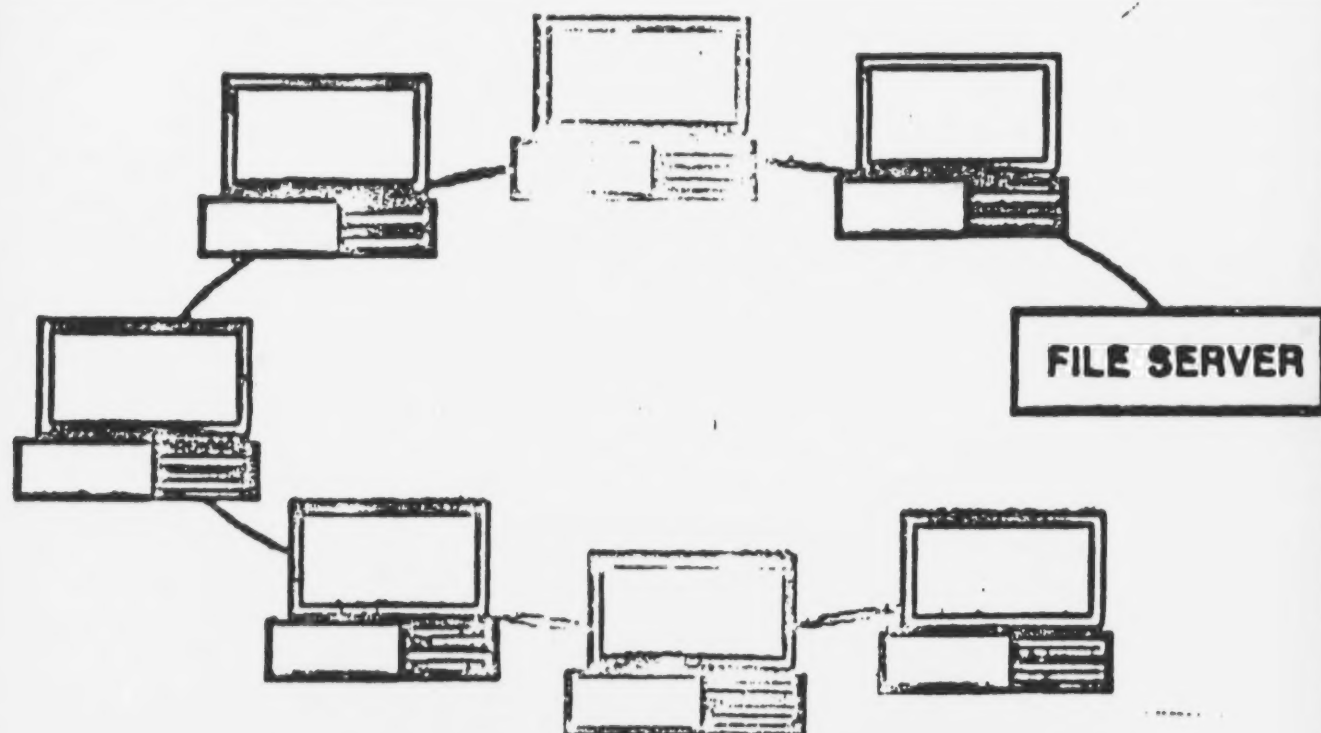
5. PRINTERS

<u>QTY</u>	<u>DESCRIPTION</u>
9	Near Letter Quality, 80 column, Dot-Matrix, Graphics, parallel interface, Draft Mode option, 160 cps, Epson Fx86 Series. One included with each File Server (ie. 8 with Fileservers), one extra ordered.

6. MODEMS

<u>QTY</u>	<u>DESCRIPTION</u>
9	Multi-Tech 212AH2 1200 bps Modem. Features Auto dial and Auto answer, pulse or touch-tone dialing support, full or half-duplex to signal transmission.

PLATO CLUSTER PRODUCT



**Authoring, Lesson Delivery, Instructional
Management**

Rostering and Record Keeping

Catalogs of Courseware

Download and Upload from/to Mainframe

Introduction to Local Area Networks

A Local Area Network (LAN) is a communications network.

Key characteristics of LANs are:

- * High data transmission rates (100,000 to 100 million bits per second)
- * Short distances (100 feet to 30 miles)
- * Low error rate (less than 1 error in 100 million bits).

The Local Plato Delivery System (LPDS) and Instructional Administration System (ADMIN) are proprietary systems which include the following features:

- * Bus topology...A single cable is terminated on both ends into which all nodes tap. Cable length between nodes can range from 3 to 1500 feet.
- * Protocol...CSMA/CD (Carrier Sense Multiple Access/Collision Detection). A LAN Protocol is nothing more than the traffic controller on the equivalent to a telephone party line. A method of maintaining one-to-one conversations is necessary. Data is sent over the network broken into small 'packets' of 64 to 1500 bytes. At the head of each packet is the address of the intended recipient and the address of the sender. The tail of the packet contains an error correction code to verify that the data received was the same as that sent. *Carrier sense* means that each transmission is listened to by its sender to hear if it was understandable. If the message was garbled, the intended receiver is told to forget what they heard and another attempt is made. *Multiple Access* means that each node has access to the network at any time. Like an unruly conversation, anyone can talk at any time. This creates the potential for collisions on the network and must be dealt with in some manner. *Collision Detection* is the method by which each sender listens to its transmission to see if it has been clearly received. If a collision is detected, the sender 'backs off' for a random amount of time and transmits again. It is easy to see that collisions will slow the network down and that the network performance depends on network traffic and the number of nodes installed.

Another cause of collisions is the travel time required by the data packets. On network runs of about 1000 feet or more, the data packets sent by one node may not reach the receiving node before that node assumes a quiet cable and sends a packet of its own, causing a collision. Therefore, the longer network runs will have more collisions.

- * Bandwidth...The base frequency used to transmit the information along the network determines the speed of transmission. The LPDS and ADMIN networks are called baseband which means that the signal is not modulated to a radio frequency carrier like those of television stations. This type of transmission limits the network to one channel of information but greatly reduces the hardware cost of the network cards. The bandwidth of the network is 10 MBPS.

DESCRIPTION OF A COMPUTER-MANAGED INSTRUCTIONAL SYSTEM

PLATO LEARNING MANAGEMENT SYSTEM

The PLATO Learning Management (PLM) system is a computer-based system that helps instructors and authors organize instructional materials for individualized delivery and manages the delivery process for students. Instructors and authors need not acquire programming skills in order to use the full power of this system to administer tests, prescribe individualized study assignments, and keep important records.

PLM is designed to support a well-defined model of instruction characterized by modular organization of content and materials, defined mastery criteria, and self-pacing. Usually, instructors and authors can do much to adapt the base model of instruction to their particular needs simply by using the many options available.

CHARACTERISTICS OF THE PLM INSTRUCTIONAL MODEL-

Courseware Modularity

All activity is organized around learning objectives that can be tested by the PLATO system or evaluated by the instructor. Learning activities are defined by the objective or set of objectives they cover. Modules are groups of objectives, courses are groups of modules, and curricula are groups of courses.

Mastery Learning

Each PLM student works at his or her own pace and proceeds to subsequent topics only when able to demonstrate the necessary proficiency in prerequisite areas.

In the PLM system, the term "failure" is not used; rather, the terms mastery and non-mastery are used to indicate the level of student performance.

Individualized Instruction

Only those learning materials appropriate to measured student needs are prescribed.
model.

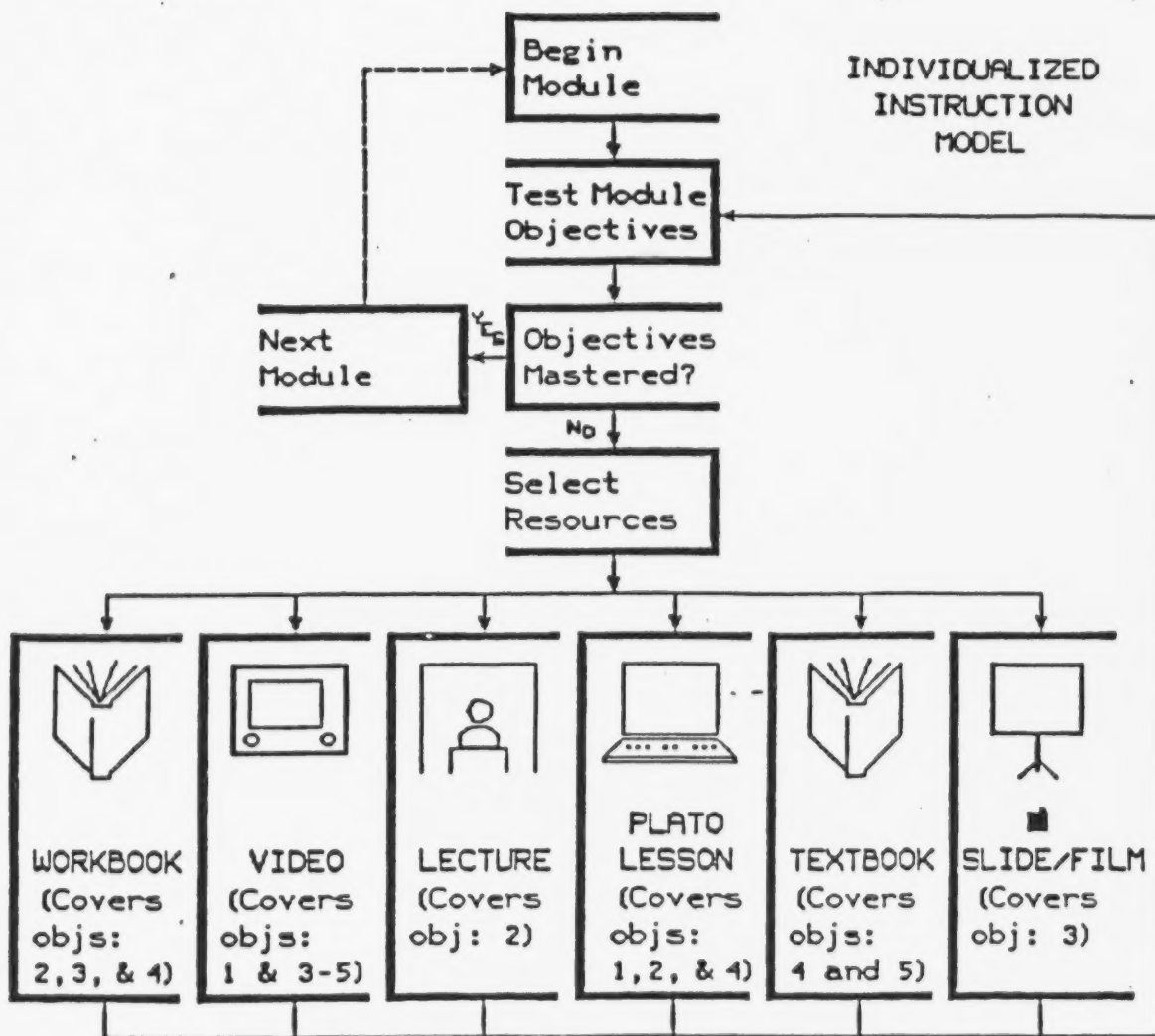


Figure 1-1. Individualized Instruction Model

PRIMARY PLM COMPONENTS

There are four primary PLM components:

Curriculum

Course

Module

Instructional Unit (IU)

The largest component is the curriculum, and each curriculum can include a maximum of 15 courses. A course can consist of up to 28 modules, each containing a maximum of 30 IUs. An IU can contain 60 questions that test a single educational objective.

Each PLM component has various options. Among the most important options are those in the curriculum and course Variable Management Strategies (VMS). The instructor with curriculum access can tailor PLM structures to different student groups by controlling such VMS options as course presentation and student directions.

From the curriculum, to the course, module, and finally IU, controls become more specific to allow tailoring instruction to the individual student.

PLM OPERATION

Many options exist for presenting courses and modules to PLM students.

If the placement testing option is used at either the curriculum or course level, the system can check for both readiness and prior mastery of subject areas. The curriculum test results are automatically used to select appropriate courses for each student. Similarly, the course level pretest results select modules.

A student usually works in a module first by taking a diagnostic test covering the objectives defined in the IUs of the module. At the end of the test, the system directs the student to the optimal set of learning resources covering the unmastered objective(s).

The student may retake a test after studying the selected learning resources. Should the student again not master the objectives, he or she is directed to additional learning resources. This process of studying learning resources and taking a test continues until the student shows satisfactory performance on a sufficient number of module objectives.

PLM USER MODES

Author Mode

A user does not have to be a programmer to develop a PLM curriculum or module. Instead of programming, the author may use a wide set of authoring tools which comprise "author mode." The PLM author designs, constructs, and revises curricula, courses, modules, IUs, and test questions and performs many other tasks using these tools.

Instructor Mode

Instructor mode provides administrators and evaluators non-programming tools for using PLM.

The instructor registers students in the appropriate group and inspects and changes individual student records in the PLM gradebook as necessary. Instructors and evaluators can review group summary data in the form of tables and graphs.

An instructor with curriculum access can perform the functions of an author.

Student Mode

Student mode is the appearance of PLM to users with student "sign-ons" (registration). This mode presents courses and modules to students. The author determines which of several other options (such as gradebook access, display of objectives, and student notes) will be presented to students.

STUDENT MODE OVERVIEW

In order to better understand the PLM system, the student mode must be discussed. This section outlines what displays and options the student encounters when working in the PLM system. Refer to flowcharts 1-3.

Curriculum

When first entering a curriculum, the student receives some important and carefully organized introductory material. A welcome message and curriculum introduction, written by the author, are presented first. Further customized introductory material may follow if the author provides a PLATO lesson for this purpose. A placement test will come next, if one has been specified within the curriculum design.

After completing this introductory material, the student is routed directly to the Course Selection Display (or directly to the Course Modules List if the curriculum only has one course). The student then selects a course and is taken to it.

Course

Like the curriculum level, the course level also has a series of introductory displays and activities. There is a Course Welcome Display which will show the author's message. If the author specifies, each course can present an introductory PLATO lesson and a course placement test.

Module

The student enters a module by selecting it on the Module Selection Display.

The objective is a statement of what is to be learned and how mastery will be measured. Because of its importance, the objective statement is always available to the student before beginning a test or reviewing study assignments. The Objective Status Display shows which of the objectives in the module have been mastered or attempted. From this display, the student can also access a statement for each objective.

A student can begin a new session by reviewing a current study assignment by selecting an option on the Module Introduction Display. If the appropriate rule is set by the instructor, a student can view the study assignment list prior to any testing in the module. After an unsuccessful attempt to master the module test, the PLM system generates a study assignment for the student.

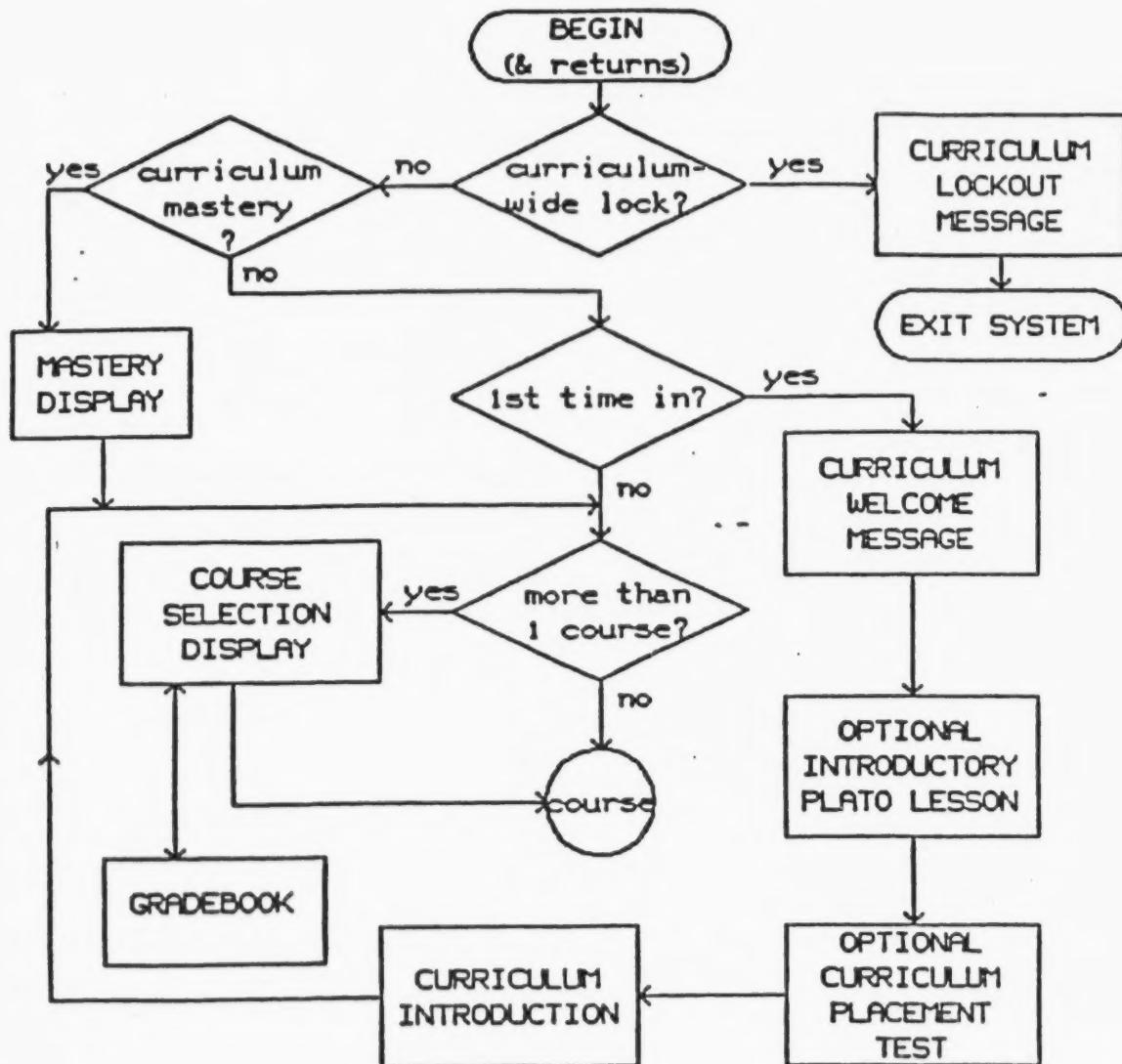
If a module has unmastered prerequisites, no testing in the module is allowed. From the Module Introduction Display, though, the student can choose an option to see a list of the prerequisite modules.

When ready, the student may select the option to take the module test which consists of a sequence of either true-false, multiple choice, matching, touch, numerical, or short answer questions. The test is terminated according to student performance, and the results are displayed. If the test is mastered, the student is returned to the Module Selection Display. If mastery has not been achieved, the student selects either to review the objective status or to see a new study assignment. From either of these displays, the student returns to the Module Introduction Display.

Depending on the rules set by the instructor, testing for the module may be locked as a consequence of one or more unsuccessful attempts at module mastery.

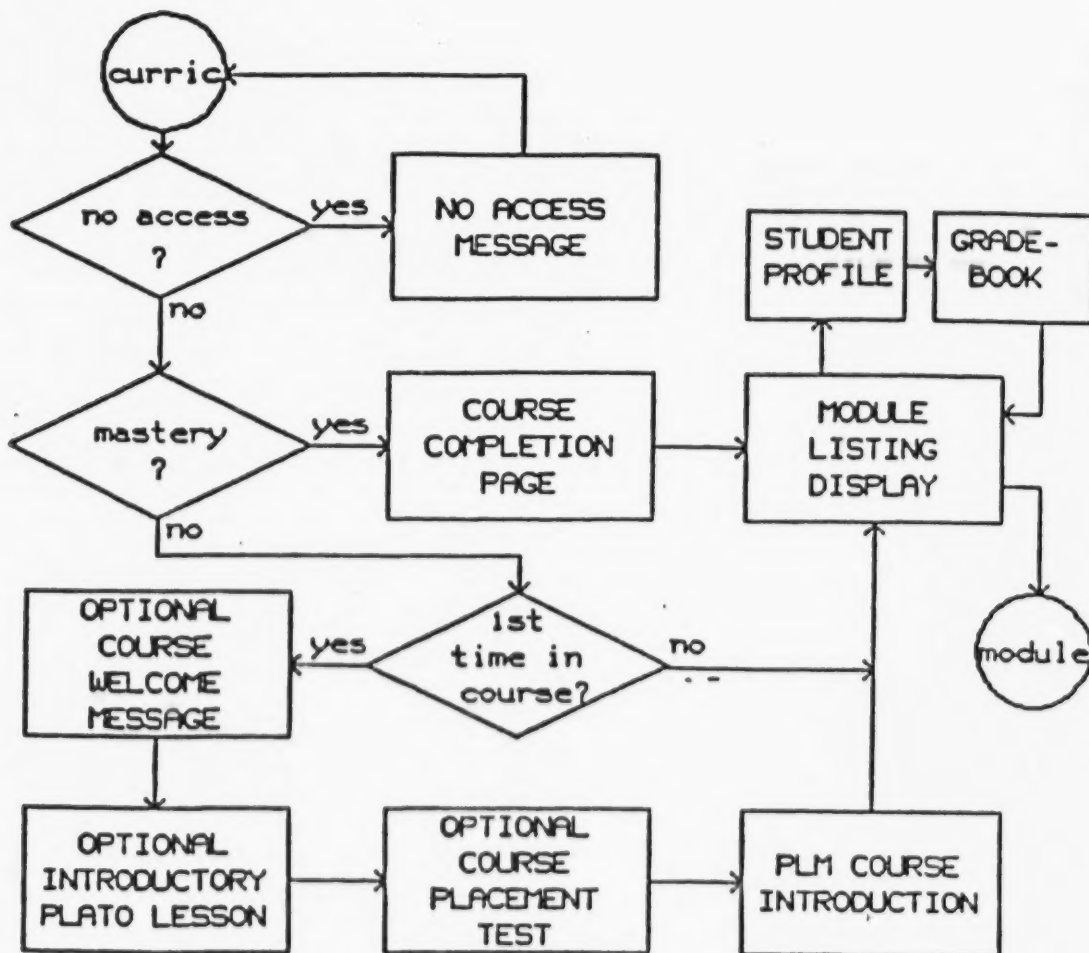
PLM STUDENT MODE FLOWCHARTS

The following are the PLM student flowcharts for the curriculum, course, and module.

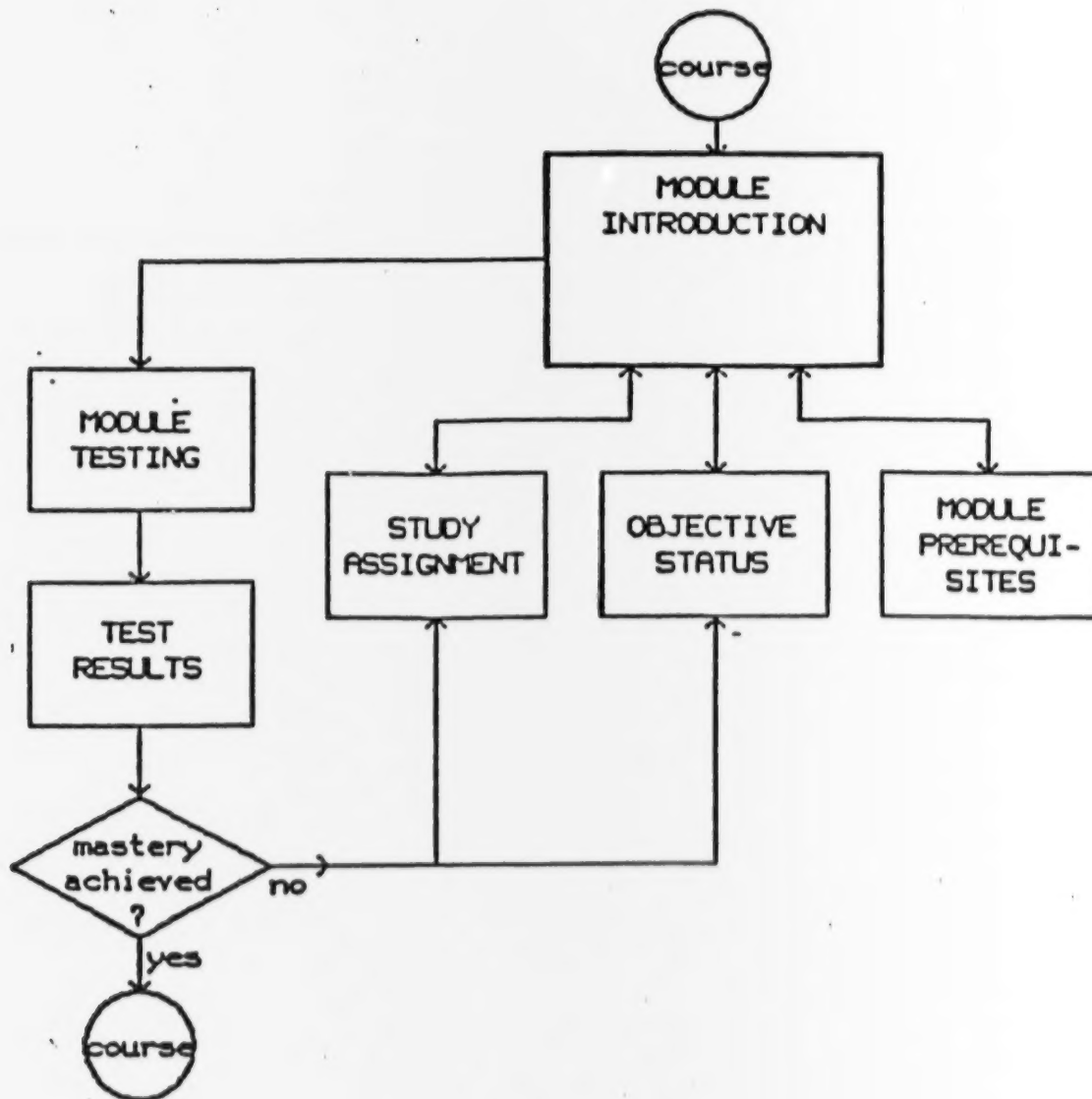


Student Mode: Curriculum Level Flowchart (1 of 3)

Figure 1-3



Student Mode: Course Level Flowchart (2 of 3)
Figure 1-3



Student Mode: Module Level Flowchart (3 of 3)
Figure 1 - 3